

APPLICATION NOTE: POWER SUBSTATIONS

Lightning Detection Important for Safe Electrical Substation Operations

"When working outdoors, supervisors and workers should continuously monitor weather conditions.

"Supervisors and workers at outdoor worksites should take lightning safety seriously."

- OSHA/NOAA

Lightning Safety Fact Sheet

Summary

Substations are an essential part of the electrical power grid in the United States, with over 300 million customers who depend on a reliable power source for daily use.

Lightning strikes in particular are a threat to plant safety and operations, making lightning detection, and other meteorological data, important to plant managers for operational decision-making.

Lightning Strikes Pose Danger

Twenty-five million lightning strikes occur in the US every year, with a single bolt containing up to one billion volts of electricity. This high voltage poses both immediate and potential risks to electrical substations.

Besides careful placement of lightning rods to ground any strikes that do occur, the safety of maintenance and repair workers is of the utmost importance. Overvoltage puts anyone within direct contact in danger. Operation managers need to know when lightning has struck near the station, putting workers at risk.

According to OSHA's Lightning Safety Fact Sheet, "Employers should recognize lightning as an occupational hazard (and) should take lightning safety seriously." The recommended Emergency Action Plan includes lightning safety protocol for outdoor workers specifying when to suspend or resume outdoor work activities given the lightning information available. Many utility companies do not send workers out for substation maintenance and repair if there has been a lightning strike within a certain radius.





The Pulsar 800 Weather Station provides critical data for decision-making and employee safety.

Weather Monitoring Helps Utilities Operate Safely

The unique lightning detection feature of Columbia Weather System's Pulsar 800™ Weather Station makes it a valuable safety tool for utility maintenance and operations. The lightning sensor analyzes radio wave emissions and delivers a count of recognized strikes within a 10 km (6.2 mile) radius, providing reliable data even in extreme conditions.

The Pulsar 800 Weather Station also includes Doppler radar precipitation, ultrasonic wind speed and direction, temperature, relative humidity, air pressure, and solar radiation data.

These factors also can have a significant impact on a substation. Storms often mean high rainfall and strong winds that can knock down trees and fences, causing additional damage.

Wind speed data is used by some power utilities as a work/no work parameter. Operating certain company vehicles and working from bucket trucks for maintenance and repair poses safety risks during high winds. If winds reach specified speeds, workers are not authorized to proceed.

The Pulsar 800 Weather Station also offers:

- All-in-one sensor head for easy installation
- No moving parts for virtually no maintenance
- Internal compass for automatic wind direction alignment
- Interface to SCADA system with a MicroServer

Combined, these features make the Pulsar 800 Weather Station “an all-in-one source for making informed decisions,” says CWS President Nader Khoury.

Professional Weather Stations. Professional Weather Monitoring.

Integrating cutting-edge technology in met sensor and monitoring options, at Columbia Weather Systems, our job is to make weather monitoring easy so professionals like you can focus on doing their job in the most effective way possible.

Call or email to discover how we can help make weather monitoring easy for you: 1 888 508-7375 / info@columbiaweather.com

For additional information visit: ColumbiaWeather.com
www.Lightningsafety.noaa.gov

